Map Document: (S:\Projects\PASSAIC\MapDocuments\4553001-CERCLA\Sedimentation_Bathymetry_1989-2004_22x34_scour_bins_15miles.mxd)
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Point Locations:
The average sedimentation rate (units of inches/year) equals the average of the two cesium-137 calculations and the lead-210 calculation (whenever possible). Some isotope data were not used in the sedimentation rate calculations because of discontinuities in the cores, which suggest dredge events.

Cesium-137 Methodology
- Plotted a downcore profile of cesium-137 concentration (pCi/g) versus depth, where "depth" equals the average of the top core depth and the bottom core depth. Nondetectable cesium concentrations were set to zero.
- Calculated two sedimentation rates: one for the 1963 time horizon (cesium-137 peak concentration) and one for the 1954 time horizon (base of the cesium-137 peak). Note that some cores only showed one time horizon; other cores showed neither time horizon.

Lead-210 Methodology
- Plotted a downcore profile of polonium-210, which is the daughter product of lead-210, versus depth. It was assumed that polonium-210 was in secular equilibrium with lead-210, and no adjustments in activity were made.
- In the profiles, "depth" equals the average of the top core depth and the bottom core depth. Nondetectable polonium concentrations were set to zero. Concentrations were plotted as the logarithmic concentration.
- Calculated one sedimentation rate using the slope of the polonium-210 profile where slope = -lambda/(2.303× sedimentation rate) where lambda represents the decay constant.

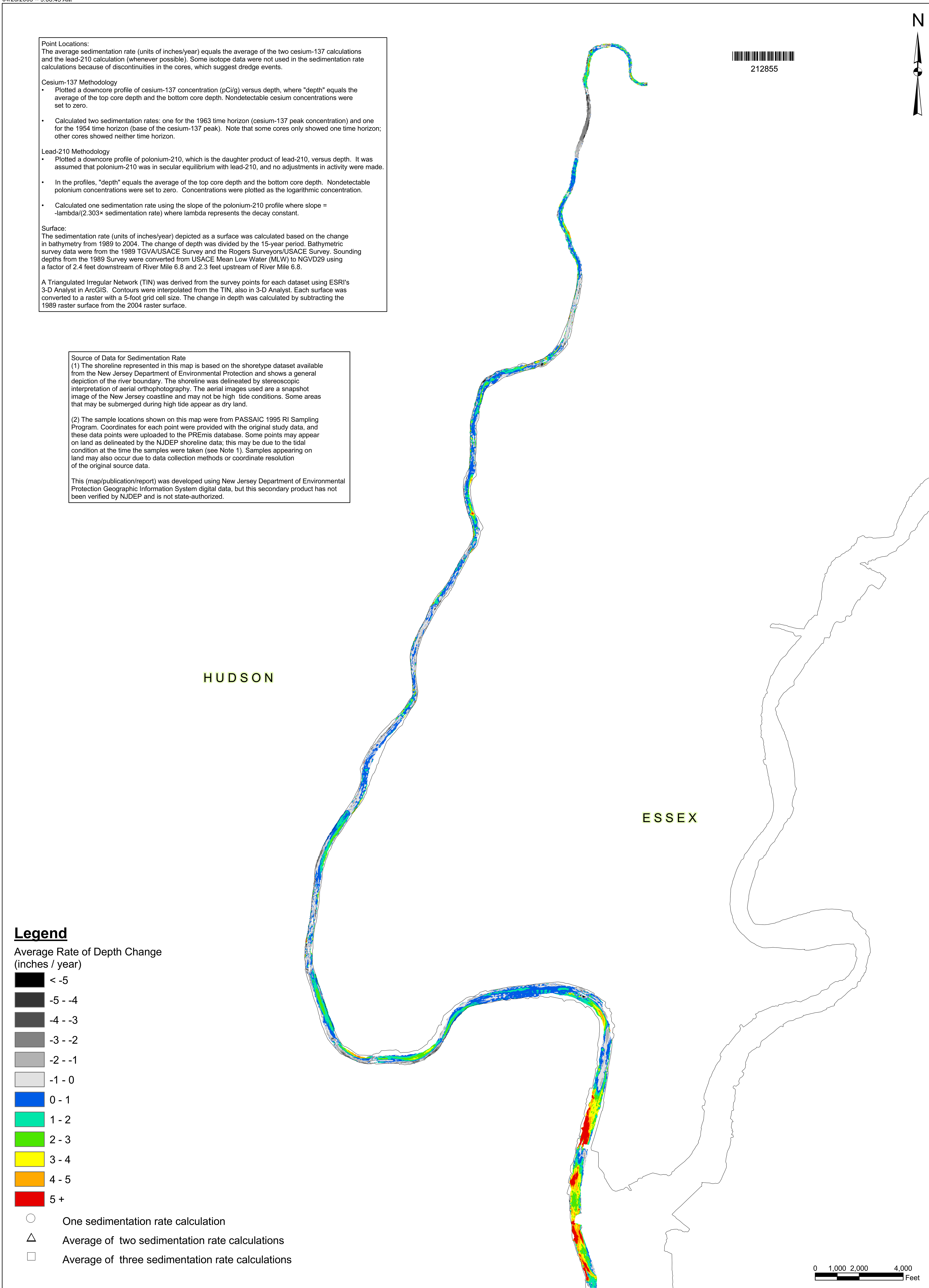
Surface:
The sedimentation rate (units of inches/year) depicted as a surface was calculated based on the change in bathymetry from 1989 to 2004. The change of depth was divided by the 15-year period. Bathymetric survey data were from the 1989 TGVA/USACE Survey and the Rogers Surveyors/USACE Survey. Sounding depths from the 1989 Survey were converted from USACE Mean Low Water (MLW) to NGVD29 using a factor of 2.4 feet downstream of River Mile 6.8 and 2.3 feet upstream of River Mile 6.8.

A Triangulated Irregular Network (TIN) was derived from the survey points for each dataset using ESRI's 3-D Analyst in ArcGIS. Contours were interpolated from the TIN, also in 3-D Analyst. Each surface was converted to a raster with a 5-foot grid cell size. The change in depth was calculated by subtracting the 1989 raster surface from the 2004 raster surface.

Source of Data for Sedimentation Rate
(1) The shoreline represented in this map is based on the shoretype dataset available from the New Jersey Department of Environmental Protection and shows a general depiction of the river boundary. The shoreline was delineated by stereoscopic interpretation of aerial orthophotography. The aerial images used are a snapshot image of the New Jersey coastline and may not be high tide conditions. Some areas that may be submerged during high tide appear as dry land.

(2) The sample locations shown on this map were from PASSAIC 1995 RI Sampling Program. Coordinates for each point were provided with the original study data, and these data points were uploaded to the PREmis database. Some points may appear on land as delineated by the NJDEP shoreline data; this may be due to the tidal condition at the time the samples were taken (see Note 1). Samples appearing on land may also occur due to data collection methods or coordinate resolution of the original source data.

This (map/publication/report) was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



Legend

Average Rate of Depth Change
(inches / year)

- < -5
- -5 - -4
- -4 - -3
- -3 - -2
- -2 - -1
- -1 - 0
- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 +

○ One sedimentation rate calculation
△ Average of two sedimentation rate calculations
□ Average of three sedimentation rate calculations

MALCOLM PIRNIE

PRELIMINARY DRAFT

LOWER PASSAIC RESTORATION PROJECT
CONCEPTUAL SITE MODEL
ISOTOPE SEDIMENTATION RATES
AND BATHYMETRY-BASED DEPTH CHANGE

MARCH 2005

FIGURE 3

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